FOCUS

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The Mathematical Association of America
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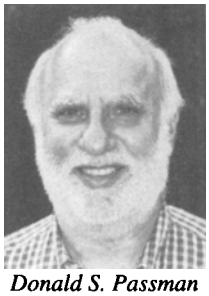
Distinguished Teaching Award Winners to Speak at January 2000 Meeting in Washington, DC

The opportunity to experience top-notch expository talks is one of the high points of the national meetings of the MAA. This January, we can listen to and learn from three of the best mathematics teachers in the country. Professors Arthur T. Benjamin, Donald S. Passman, and Gary W. Towsley will be awarded the **Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics** at the Joint Prize Session at the Washington, DC meetings in January 2000. They will speak at a session to be held on Friday, January 21 from 3:30 to 5:00 p.m., providing us with an opportunity to learn first hand what made them such extraordinarily successful teachers.

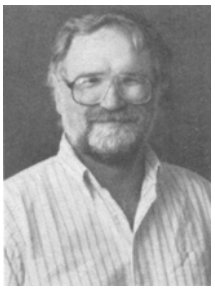
Arthur T. Benjamin

Arthur T. Benjamin, of Harvey Mudd College in Claremont, CA, is described by students as "enthusiastic," "lucid," and "entertaining." He inspires them to learn by making his classes highly interactive and by learning every student's name before the semester begins. He has supervised many senior theses and independent studies, many of which have led to research publications. His talk is titled "Magical Moments in Teaching."



Donald S. Passman

Donald S. Passman has spent many years at the University of Wisconsin, Madison, and is praised for his deep understanding of the way students learn. He is a prestigious research mathematician, with over 140 publications. He has taken seriously the task of preparing K-12 teachers, and has run enrichment classes in elementary schools. He also coaches a Math Counts team in middle school. Dr. Passman is cited for his effortless style and his sense of humor, which students say make his courses fun in spite of the work he demands. He has chosen to speak on "The End of Calculus."



Gary W. Towsley

Gary W. Towsley, of State University of New York College at Geneseo, is a versatile, creative, helpful and caring teacher. He conveys to his students his enjoyment of mathematics, his commitment to teaching and learning, and his genuine concern. He sets high standards, but he motivates and encourages his students to fulfill their potential. His versatility is extraordinary: he has taught 24 different undergraduate courses and 5 graduate courses in mathematics, and has co-taught advanced courses in many other disciplines. He was named Distinguished Teaching Professor, the highest academic rank in the SUNY system, in 1997. "What Does Mathematics Have to Do With Dante?" is the title of his address. ■

FOCUS

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National Commission Named to Help Raise Quality of Math and Science Teaching

Secretary of Education Richard W. Riley announced this summer the appointment of a National Commission on Mathematics and Science Teaching for the 21st Century, to be chaired by former U.S. Senator John Glenn. The Commission's charge is to develop a strategy that will help raise the quality of mathematics and science teaching in the nation's classrooms. It will address the fact that a quarter of math and science teachers have not majored or minored in the subjects they teach. The Commission's first meeting happened in September.

With a surge in school-age population—"the baby boom echo"—and a record number of teacher retirements, the U.S. will be facing a teacher shortage during the next decade. In fact, such shortages were already in evidence in many places this fall. Over the next few years, some 2.2 million additional teachers will be needed in mathematics and science. The Commission will therefore also consider ways to improve the recruitment, preparation, retention, professional growth and support for mathematics and science teachers in K-12 classrooms nationwide. The Commission will issue its report by the fall of 2000.

Riley noted that thirty years after the U.S. sent a man to the moon, "We commemorate the historic achievement that challenged our nation to reach new heights in math and science. Now, we need to set the stage for advancements in math and science for the next thirty years. We need to ensure that we have a high quality teaching force to prepare our youth for the challenges they will face during their lifetime."

The members of the Commission include prominent business, education, civic and government leaders as well as grassroots teachers and school administrators. Two of them, Deborah L. Ball of the University of Michigan and Diane Briar of the Pittsburgh Public Schools, are members of the MAA. The complete list of commissioners can be found on MAA Online at http://www.maa.org/news/glenn.html. The Glenn Commission is a part of the **America Counts** initiative. For more information on the Commission and its work, see their web site at http://www.ed.gov/inits/Math/Glencom.html.

C M L

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Additional copies are $37.00 each plus shipping an handling.
The 99-00 CML will be distributed later this Fall.
The electronic CML is updated monthly, and is located on MAA Online at www.maa.org.

FOCUS Deadlines

	January	February	March
Editorial Copy	November 13	December 15	January 19
Display Ads	December 3	January 4	February 4
Employment Ads	November 25	December 30	February 2

The MAA's CUPM Pushes Curriculum Initiative

The Committee on the Undergraduate Program in Mathematics (CUPM) kicked off a major curriculum initiative during the recent Mathfest in Providence. CUPM has determined that their curriculum initiative will focus on what students should know and experience as they complete their mathematics requirements, including the types of problems students should be able to solve, the technology students should be able to utilize, and the mathematical and process skills that students should have.

Need for curriculum initiative

The need to revisit the undergraduate mathematics program is clear. Many changes have occurred since the last extensive CUPM curriculum initiative: career opportunities for students have changed; technological advances have altered what students need and are able to know; major curriculum modifications have been made at the precollege level; college and university populations have become more diverse; transfers between and among institutions is much greater than in the past; and other disciplines have redefined the mathematics their students require.

CUPM anticipates producing documents and materials in three interconnected areas: Expectations for graduates with a major in the mathematical sciences; the overall undergraduate program offered by a department of mathematical sciences; and articulation in mathematics from school to college and among colleges.

The initiative recognizes, first, that one curriculum is not appropriate for all majors. Students' needs and goals have expanded. Most mathematical sciences majors accept employment immediately upon graduation. Significant mathematics teacher shortages are developing. The major for these students should vary in some ways from that for students planning to pursue graduate work in the mathematical sciences. More disciplines require deeper mathematics. Consequently, the mathematical preparation of this diverse audience calls for a broader, more flexible major.

Second, the mathematics program must serve a wide variety of mathematics-intensive majors. The program needs to be responsive to the needs of other disciplines. It must provide appropriate preparation for teachers of mathematics at the elementary, middle, and high school levels. It must serve the quantitative literacy needs of a very large population often enrolled in, but ill served by, college algebra courses. In addition, at many colleges the mathematical sciences department has responsibility for programs in statistics and other mathematical disciplines.

Third, two- and four-year college mathematics departments must develop programs that respond to a variety of reform efforts at all levels, the impact of the NCTM standards, the emphasis on competency testing at all levels, and the large number of transfer students moving among collegiate institutions. The NCTM Standards have had a major impact upon school mathematics preparation. Further, many states have prepared articulation agreements for transfer of students between and among two- and four-year colleges. Even without such agreements many institutions negotiate plans for the transfer of students. At present there is no general guidance or consensus on expectations of students.

The CUPMs Subcommittee on Calculus Reform and the First Two Years (CRAFTY) will begin working on the initiative through a series of interdisciplinary workshops. There is need for direct input from the partner disciplines — CRAFTY will receive such input from its workshops, each focused on a cluster of mathematics-intensive disciplines. The first workshop, centered on physics and computer science, took place at Bowdoin College from October 28–31. The second workshop, focussed on the calculus needs of engineering and physics, will take at the United States Military Academy from November 4–7.

Request for Involvement

Producing valuable guidance to departments requires involvement of the whole mathematical community. The initiative has just begun and participation is needed in all areas.

MAA Members: Get involved in discussions. Form focus groups and forward your conclusions to CUPM. Organize discussions at Section meetings. Provide analyses and opinions to of CUPM.

Mathematical Sciences Departments: Who are your students? What is their preparation? What majors do they enter? What careers do they enter? What do you expect them to know upon completion of their studies? Summarize your conclusions and provide information to CUPM.

MAA Committees: To the extent that this initiative fits your mission, feel that you are a full participant in assisting this enterprise. Incorporate activities into your agenda and establish a means to communicate with CUPM.

Representatives from other disciplines: Talk with members of mathematical sciences departments about the needs of your discipline. Become involved in the curricular decisions of your professional societies. Be sure that these discussions include mathematics. Think about expectations and outcomes. Provide analyses and opinions to CUPM.

Potential employers: Become involved in the discussions of mathematical preparation. Participate in the meetings of MAA and other professional societies for mathematics intensive disciplines. Provide analyses and opinions to CUPM.

Mathematical sciences professional societies: Contact MAA and CUPM. Provide a means for information gathering and forwarding to CUPM. Formulate ideas in terms of expectations.

Contacting CUPM:

To contribute to the curriculum discussion, send email to CUPM at cupm-curric@maa.org or hard copy to Tom Berger, Chair of CUPM, Department of Mathematics, Colby College, Waterville, ME 04901. Email contributions are preferred. ■

Tina Straley Named Executive Director

Tina Straley

At the Providence Mathfest, the Board of Governors of the MAA approved the appointment of Professor Tina Straley, Associate Vice President for Scholarship and Graduate Studies at Kennesaw State University in Georgia, as the next Executive Director of the MAA. Very active in the Southeastern Section of the MAA, she also made her mark at the national level as editor of the MAA Notes series and as co-PI on an MAA grant from the National Science Foundation. She also has had extensive administrative experience at various levels at Kennesaw and at the National Science Foundation. Straley's term as Executive Director begins in January, 2000. ■

Survey of THE AMERICAN MATHEMATICAL MONTHLY

The Ad Hoc Committee to Study the MONTHLY is soliciting reactions to and suggestions for the MONTHLY. This committee serves under the MAA Committee on Publications. It continues a series of studies of MAA journals conducted prior to the search leading to the appointment of a new editor.

This study is intended to address matters such as editorial policy, content, level, and format. Its goal is to identify features that already make the MONTHLY successful and to recommend changes that will keep it running at top form.

The committee particularly wants to hear what things you like best about the MONTHLY, what you would like to see more of, what you like least and would prefer to see less of. All suggestions will be carefully considered, with our thanks. The full list of committee members with e-mail addresses and institutional affiliations can be found on MAA Online (http://www.maa.org/news/monthly_comm.html). Responses may be made to the chair or any member of the committee or sent to the MAA headquarters office where they will be forwarded to the committee chair.

The committee's report is due by the end of December, 1999, and so we urge MAA members and other readers to respond promptly with their comments.

David Bressoud (Macalester College, St. Paul, MN 55105; bressoud@macalester.edu) chairs the committee. Don Albers (MAA headquarters; 1529 Eighteenth St., NW, Washington, DC 20036; dalbers@maa.org) is supporting the committee in Washington. ■

MAA Awards Announced at Mathfest 1999

Carl B. Allendoerfer Awards

Victor Klee and John R. Reay
"Surprising but Easily Proved Geometric Decomposition Theorem" *Mathematics Magazine*, Vol. 71, No. 1, February 1998

Donald G. Saari and Fabrice Valognes
"Geometry, Voting, and Paradoxes" *Mathematics Magazine*, Vol. 71, No. 4, October 1998

Trevor Evans Awards

Ravi Vakil
"The Youngest Tenured Professor in Harvard History"
Math Horizons, September 1998, pp. 8–12

George Pólya Awards

David Bleecker and Lawrence J. Wallen
"The World's Biggest Taco"
College Mathematics Journal, January 1998, pp. 2–17

Aaron Klebanoff and John Rickert
"Studying the Cantor Dust at the Edge of the Feigenbaum Diagrams"
College Mathematics Journal, May 1998, pp. 189–198

Merten M. Hasse Prize

Aleksandar Jurišić
"The Mercedes Knot Problem"
American Mathematical Monthly, Vol. 103, No. 6, November 1996, p. 756–770

Lester R. Ford Awards

Yoav Benyamini
"Applications of the Universal Surjectivity of the Cantor Set"
The American Mathematical Monthly, November 1998, pp. 832–839

Jerry L. Kazdan
"Solving Equations, an Elegant Legacy"
The American Mathematical Monthly, January 1998, pp. 1–21

Bernd Sturmfels
Polynomial Equations and Convex Polytopes"
The American Mathematical Monthly, December 1998, pp. 907–922

For more information visit MAA Online: http://www.maa.org/awards/awards_mf99.html ■

Short Takes

Do You Use *Proofs Without Words*?

Roger Nelsen, whose book *Proofs without Words* was published by the MAA in 1993, is currently working on a second collection of PWWs for the MAA. Since the new book will also appear in the Classroom Resource Materials series, Roger would like to include in it a chapter on some of the various ways in which readers have used PWWs with their students, whether in or out of the classroom. If you would like to share your ideas with him, send e-mail to nelsen@lclark.edu or write him at: Department of Mathematical Sciences, Lewis & Clark College, Portland, OR 97219-7899.

New Undergraduate Mathematics Journal

Rose-Hulman Institute of Technology has announced that the first issue of the *Rose-Hulman Undergraduate Mathematics Journal* will be published in March 2000. The new journal, edited by Roger Lautzenheiser, is devoted entirely to papers written by undergraduates on topics related to mathematics. The journal welcomes articles containing new results, new and interesting proofs of old results, accounts of the historical development of a theorem or area of mathematics, descriptions of relationships between areas of mathematics and/or other fields of study, or interesting applications of mathematics. Check out their web site at http://www.rose-hulman.edu/mathjournal/ for more details.

Research Funding At Risk

At the closing of this edition of FOCUS, Congress had not yet completed the process of determining budget allocations for NSF and other agencies funding basic research. The news didn't look good however: because of funding caps established by the 1997 Balanced Budget Act, proposed levels of funding are significantly lower than in the previous year.

A New Repunit Prime

Harvey Dubner announced that he has discovered that the number R(49081), whose decimal expansion consists of 49081 ones, is a (probable) prime. Numbers whose decimal expansion consists only of ones are known as "repunits." The only other known repunit primes are R(2), R(19), R(23), R(317), and R(1031).

Personnel Changes at NSF

The National Science Foundation (NSF) has named Judith Sunley as interim Assistant Director of the Education and Human Resources Directorate (EHR) and Philippe Tondeur Director of the Division of Mathematical Sciences (DMS). Sunley, who has a Ph.D. in mathematics from the University of Maryland, has held many important positions at NSF, including as Director of the Division of Mathematical Sciences. Tondeur, whose research interests are the geometry of foliations and applications of partial differential equations to differential geometry, was until recently Chair of the Mathematics Department at the University of Illinois.

ICME-9 Coming Up

The **Ninth International Congress on Mathematical Education** (ICME-9) will be held in Makuhari, Japan from July 30 to August 6, 2000. The National Council of Teachers of Mathematics (NCTM) will soon be awarding travel grants to help American mathematics teachers attend the event. ICME is held every four years under the auspices of the International Commission on Mathematical Instruction. The ICME-9 home page is at http://www.ma.kagu.sut.ac.jp/~icme9/.

A Good Summer for Solving Well-Known Problems

Proofs of three famous conjectures were announced this summer. Thomas Hales announced a proof of the *Hexagonal Honeycomb Conjecture*, Hubert Bray announced that he had proved the *Penrose Conjecture* in General Relativity, and Christophe Breuil, Brian Conrad, Fred Diamond and Richard Taylor announced that they had completed the proof of the *Shimura-Taniyama Conjecture*, building on the earlier work of Andrew Wiles and Taylor. Among the first to break the news, in each of the three cases, was Frank Morgan, in his *Math Chat* column, which appears in MAA Online.

Correction for "The Moore Method"

Ted Mahavier pointed out a couple of errors in Peter Renz's article "The Moore Method: What Discovery Learning Is and How It Works" in the September FOCUS. The address for the web site tracking the mathematical "descendants" of H. J. Ettlinger, R. L. Moore, and H. S. Wall was given incorrectly. The correct address is http://math.nich.edu/ted/tree.html. Mahavier points out that the list includes all those clearly identifiable as descendants of this group, and that the list is being augmented as further descendants are discovered. The web site maintainers are actively seeking additional information, which may be entered online.

Correction for "Gian-Carlo Rota Remembered"

In the September FOCUS, in the article "Gian-Carlo Rota Remembered," we gave an incorrect URL for Richard Stanley's web page. The correct address is: http://www-math.mit.edu/~rstan/rota.html.

Opportunity at the Carnegie Academy for the Scholarship of Teaching and Learning

Applications are due on December 1 for faculty fellowships with the *Carnegie Academy for the Scholarship of Teaching and Learning* (CASTL). A major initiative of the Carnegie Foundation for the Advancement of Teaching, CASTL is intended to support the development of a scholarship of teaching and learning, enhance the practice and profession of teaching, and bring to faculty members' work as teachers the recognition and reward afforded to other forms of scholarly work in higher education. Check out their web site at http://www.carnegiefoundation.org/programinfo_academy.html for more information.

School Year Begins With Reported Shortage Of Teachers

As the 1999/2000 school year began, various parts of the nation reported serious shortages of teachers in many fields, including mathematics and science. Experts described the problem as driven mostly by "geography and expertise." The problems are most acute in areas to which teachers do not want to move, and in fields (such as mathematics) where specialized training is most important.■

POSITION AVAILABLE: Associate Executive Director of Membership and Programs

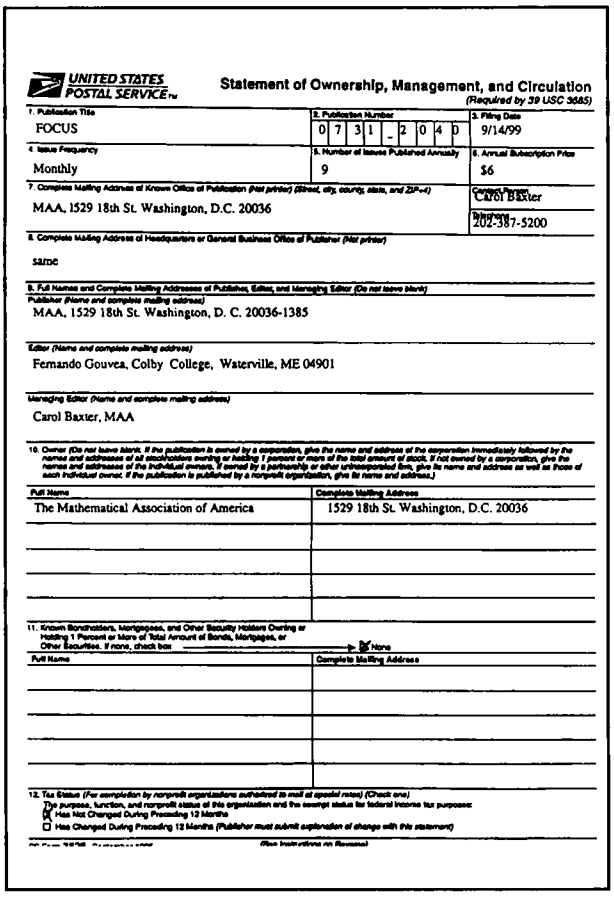
The Mathematical Association of America (MAA) is seeking a highly qualified person for the position of Associate Executive Director, Membership and Programs. Candidates should have a doctorate or the equivalent in mathematics or mathematics education, at least ten years of experience as a collegiate faculty member and administrator, and have served as the principal investigator on one or more grants or as a grants administrator. The AED will oversee all membership recruitment and retention efforts, member services, program development, grant management, and support, preparation and submission of proposals to foundations and government agencies. The AED reports to the Executive Director. He/she is a key member in the MAA's staff leadership team, and will engage with the Executive Director and other staff members, national officers, committee chairs, and others in strategic planning and program development.

The MAA, with 27,000 members, is the largest association in the world devoted to college/university mathematics. Its membership includes collegiate faculty and students, high school teachers, individuals from business, industry, and government, and people who enjoy mathematics. The MAA holds two national conferences annually, one jointly with the American Mathematical Society. There are 29 affiliated Sectional organizations, each of which also holds 1-2 meetings annually. The MAA publishes three scholarly journals, a student magazine, a newsletter, and 15-20 books annually. Over 100 committees and councils carry out significant elements of the MAA's program.

The deadline for submission of applications is December 15, 1999. If possible, interviews will be conducted during the Joint Mathematics Meetings, to be held January 19-22, 2000, in Washington, DC. It is expected that the new AED will begin work by June 2000, earlier if possible. The position is located at the national headquarters of the MAA in Washington, DC. Salary is competitive, and will be determined by the candidates' credentials. The MAA offers a generous benefits package. Candidates should send a resume and letter of interest to:

Ms. Julie Kraman
Mathematical Association of America
1529 18th Street NW
Washington, DC 20036.

Applications may be submitted electronically to: jkraman@maa.org. References will be requested after review of applications. The MAA is an Equal Opportunity Employer. Applications from individuals from underrepresented groups are encouraged. Additional information about the MAA and its programs and services may be found on MAA's Website: www.maa.org.



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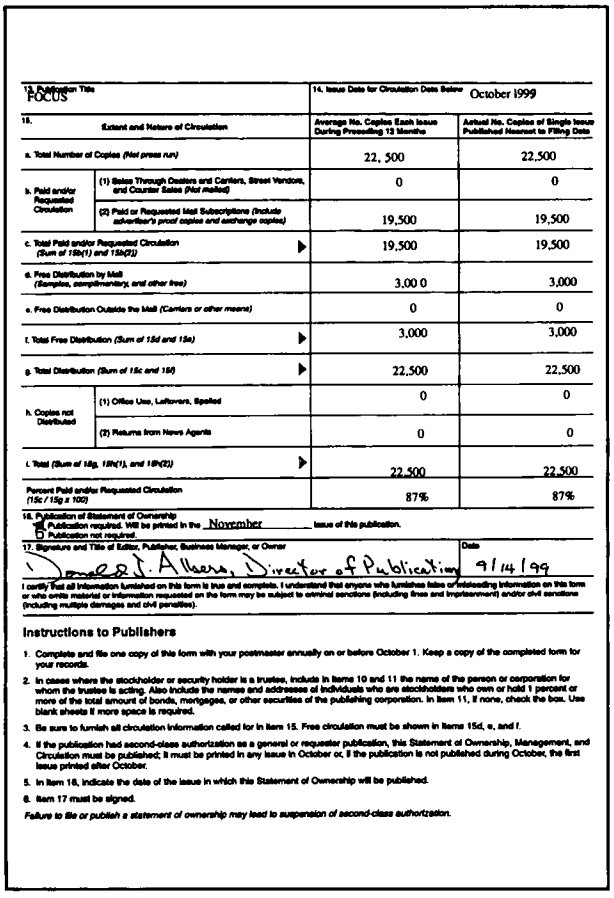

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In Memoriam

Gail Young 1915–1999

Gail Young

Gail S. Young, President of the MAA from 1969 to 1970, died on August 29, 1999. Young, a topologist, received his Ph.D. at the University of Texas in 1942, working under the direction of R. L. Moore. His scholarly work includes more than sixty papers on topology, n-dimensional analysis, complex variables, and mathematics education. His expository skills are amply demonstrated by his book *Topology*, co-authored with J. G. Hocking, which is one of the classics in the field. Young is reputed to have been an excellent teacher at all levels, and was described as having a rare sensitivity to the needs of his students.

In addition to his research and teaching, Young was deeply involved in mathematics education at all levels. He worked with the School Mathematics Study Group (SMSG) of "New Math" fame and with the MAA Committee on the Undergraduate Program in Mathematics. He was also active in the American Mathematical Society and in the American Association for the Advancement of Science. He was one of the first to emphasize the importance of breaking down the artificial barriers within the mathematical community that had been erected by the use of such terms as "pure" and "applied."

His extensive list of contributions to mathematics and mathematics education led to his receiving the MAA's Award for Distinguished Service in 1987. In the citation by Kenneth I. Gross and Peter J. Hilton (the full text of which can be found on MAA Online at http://www.maa.org/news/distinguished.html, he is described as someone who throughout his career emphasized human values in everything he did, enriching the lives of those with whom he came in contact and advancing the mathematical profession with wisdom, insight, and vision. ■

Hugh J. Miser, Longtime MAA Member, Dies at 81

Hugh J. Miser, Professor Emeritus, University of Massachusetts, died of cancer on June 22. He was born in 1917. His father was a founding member of the MAA, and Prof. Miser belonged to the MAA for more than 50 years so that, as he said, "We represent a continuing family membership throughout its history." Few MAA members can today make this claim.

He had a distinguished career. He was a founding member of the Operations Research Society of America and remained active in its affairs for many years, including serving as president in 1962–63 and editor of Operations Research from 1968 to 1974. He was also a founding member of the International Federation of Operations Research Societies and the Connecticut Academy of Science and Engineering.

Prof. Miser coauthored successful mathematical textbooks and was coeditor of the three volume *Handbook of Systems Analysis*, published between 1985 and 1995. He received many medals and awards, which recognized the contributions he made to both the national and international operations research communities. These awards ranged from the first one given to him in 1952 to two awards he received this year, including the 1999 Philip McCord Morse Lectureship Award from the Institute for Operations Research and the Management Sciences.

The MAA had planned to honor him at its 25-year banquet in Providence on August, 1999, a family tradition going back to the founding of the organization. Go to http://www.maa.org/news/miser_obit.html for a more extensive obituary. ■

Read This!
Recently Reviewed on MAA Online

MAA Online has been reviewing books for more than three years now, and more than eighty reviews are available online. The latest reviews are featured at the main reviews page at http://www.maa.org/reviews/reviews.html.

Recently reviewed books include:

***Proofs from THE BOOK*, by Martin Aigner and Günter M. Ziegler**

***Mystic, Geometer, and Intuitionist: The Life of L.E.J. Brouwer, Volume 1: The Dawning Revolution*, by Dirk van Dalen**

***Archimedes: What Did He Do Besides Cry Eureka?*, by Sherman Stein**

***James Joseph Sylvester: Life and Work in Letters*, by Karen Hunger Parshall**

***Geometry from Africa: Mathematical and Educational Explorations*, by Paulus Gerdes**

***Gnomon: From Pharaohs to Fractals*, by Midhat J. Gazalé**

***The Nothing That is: A Natural History of Zero*, by Robert Kaplan**

***Should We Risk It? Exploring Environmental, Health, and Technological Problem Solving*, by Daniel M. Kammen and David M. Hassenzahl**

***Bernhard Riemann 1826–1866: Turning Points in the Conception of Mathematics*, by Detlef Laugwitz**

***A Course in Mathematical Modeling*, by Douglas Mooney and Randall Swift**

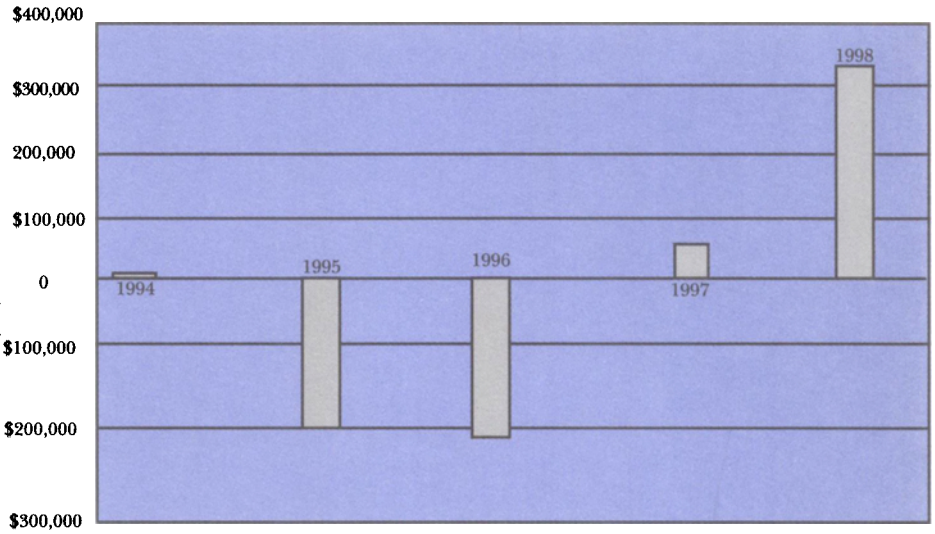
Treasurer's Report—1998 Financial Year

Gerald J. Porter

I am pleased to report that the General Fund had a surplus of $374,455 in 1998. This surplus restored a positive balance to the General Fund that had been depleted due to the 1995–1996 reorganization. The surplus was realized, despite a drop in income due to a decrease in membership, through diligence by our staff in containing costs and because funds spent on program and member services support staff were cut back. While it is important to achieve these economies in times of financial stress, the long term vitality of the MAA is dependent upon a program of quality member services and resources adequate to support them. This is the challenge we face as we enter the new millennium.

MAA General Fund—1990–1998

(not including extraordinary transfers from investments)



The chart on the right gives a quick overview of the performance of the MAA General Fund (excluding extraordinary transfers from the Investment Fund) during the last five years. The General Fund is the Association's operating budget. It includes the journal and book programs, meetings, governance, and member services. It does not include grant funded programs, the American Mathematics Competitions, or the operation of the MAA headquarters buildings.

The MAA Endowment Fund benefited from the robust stock market in 1998 and increased in value by $237,505 before a transfer of $42,094 to the General Fund and the creation of the James Leitzel Fund ($37,903). The American Mathematics Competitions, had a surplus of slightly more than $145,000 in 1998.

We discuss the operating budget, grant activity, the headquarters building fund, the American Mathematics Competitions and the investment fund individually below. I am glad to acknowledge the assistance of our Director of Finance, Neil Beskin, in preparing this report. Neil joined the MAA in December, 1997.

What happened in 1998

- The administrative cost of running the Washington office was reduced by $36,500 in 1998.
- The amount that we pay for publications and membership fulfillment increased by 2% in 1998. We are now able to allocate this cost more accurately.
- Funds spent on programs and services decreased by $179,000. The majority of this decrease was due to staff cutbacks. As we build for the future we will need to restore these staff positions.
- Upon the advice of our auditors we took a charge of $27,600 for slow selling books; in 1997 we wrote off $80,000 of inventory.
- Dues income decreased by $128,000. The Association must be concerned about the decreasing membership.
- Contributions to the General MAA Fund decreased by approximately $40,000. Contributions of $38,000 to the James Leitzel Fund were received in 1998 but are not included here.
- Journal income (other than dues) increased by $53,000.
- Book sales increased by $37,000 to $1,070,000.
- Indirect costs recovered on grants increased by over $30,000 because of a higher level of grant activity.

Externally Funded Projects

During 1998 the MAA received external project support of $1,007,533. This was up from the $847,347 received in 1996. As a result, the indirect cost recovery of administrative expenses increased from $97,526 in 1997 to $128,756.

American Mathematics Competitions

The MAA manages a high school and a junior high school national mathematics competition. These activities are managed from our office in Lincoln, Nebraska. Students who perform well on the high school examination are invited to compete for participation on the U.S. Math Olympiad team. This competition takes place through two additional exams, the USAMO and the AIME. In 1998 the income from these examinations totaled $831,218 while expenses were $685,852.

Building Fund

The Association owns two adjoining townhouses and a "carriage house" at 1527 and 1529 Eighteenth Street NW, Washington, DC. The MAA Washington office occupies 1529, most of the "carriage house," and a small amount of 1527. The remainder of 1527 is rented to other mathematical organizations including the

AMS, and CBMS. In 1998 we "charged" ourselves $216,400 for the space we occupied. That amount is included in Building Fund Income.

During the fall of 1998 and the spring of 1999 the exterior of 1529 was restored to its original appearance. Please stop by the buildings when you are in Washington.

Building Fund Income:	$330,748
Building Fund Expense:	$328,243

In 1998, depreciation on the building and renovations was $122,558.

Endowment Fund

The MAA Endowment Fund includes both restricted and unrestricted funds. At the end of 1998 the Endowment was valued at $2,040,360 up from $1,764,952 at the end of 1997. During 1998, $42,094 was transferred from these funds to support prizes and other activities designated by the original donors to the MAA. An additional, $23,748 was transferred from the Sliffe Trust. $37,903 was added to the endowment to establish the James Leitzel Fund and $10,000 was added to the Haimo Prize Fund.

The MAA Endowment Funds are, according to accounting standards, divided into Unrestricted, Temporarily Restricted and Permanently Restricted. The values of these funds at the end of 1997 and 1998 are listed to the right.

The Sliffe Fund

The last will and testament of Edith May Sliffe established a fund (The Sliffe Fund) to fund awards to selected teachers whose teams qualified in the American Mathematics Competitions. The MAA was selected as the Trustee of this fund. On December 31, 1998 the Sliffe Fund had a value of $589,125. The MAA also is the trustee of a trust established by Clinton B. Ford in memory of Walter B. Ford. This trust had a value of $100,908 on December 31, 1998.

General Fund Balance

The General Fund Balance is the cumulative sum of yearly balances in the general fund. It is a measure of how the Association has done over time and an indication of the Association's cash flow position. This balance increased last year by $374,455, which was the surplus in the General Fund for the year.

December 31, 1997	December 31, 1998
($150,268)	($224,187)

General Fund Balance

	December 31, 1997	December 31, 1998
Unrestricted board designated	$1,284,869	$1,490,556
Temporarily restricted	$371,873	$431,594
Permanently restricted	$108,210	$118,210
	$1,764,952	$2,040,360

Endowment Fund

Supporting Materials

Supporting materials for this report are available on the World Wide Web. These include the following:

1. Building Fund Report, 1998: http://www.maa.org/features/reports/98building.html

2. American Mathematics Competitions, 1998: http://www.maa.org/features/reports/98amc.html

3. **Income and Expense by Activity, 1998:** http://www.maa.org/features/reports/98accounts.html

4. **Grant Income, 1998:** http://www.maa.org/features/reports/98grants.html

5. **Investment Fund Report—December 31,1998:** http://www.maa.org/features/reports/98invest.html http://www.maa.org/features/reports/98invest.html

6. **Balance Sheet:** http://www.maa.org/features/reports/98balance.html

Overview: The Operating Budget for 1998

Where the money came from

Total income for 1998 was $4,669,315 down from $4,841,836 in 1997. This was derived as follows:

	1997	1998
Dues	$2,073,830	$1,945,975
Contributions	$227,540	$186,967
Journals (other than from member subscriptions)	$783,113	$836,332
Publications	$1,033,329	$1,070,029
Allocated Indirect Cost Recovery	$117,016	$87,705
Transfer from Investments	$134,174	$62,842
Indirect Costs on Grants	$97,526	$128,756
Meetings/Minicourses/Shortcourses	$257,794	$231,086
Building Management Fee	$25,000	$25,000
Miscellaneous	$92,514	$94,623
TOTAL	$4,841,836	$4,669,315

Dues includes member dues, institutional dues, corporate dues, and a payment from the Life Membership Fund for life members.

Contributions include the Greater MAA Fund and the dues supplement.

Journals include subscriptions other than member subscriptions, sales of back issues and royalties received.

Publications income includes sales of MAA books and reports, placement tests, and video tapes.

Allocated Indirect Cost Recovery is indirect costs recovered from MAA activities that are not included in the Operating budget. This includes Olympiad activities and the American Mathematics Competitions.

Investments are funds that are transferred from Investment Funds to support specified prizes and other activities as well as special transfers. In 1997 there was a special transfer of $75,000.

Indirect Costs on Grants is income on externally funded activities that support MAA administrative activities. Not all funding agencies pay indirect costs.

Meetings and Courses are registration fees from minicourses, shortcourses, and the online courses; net income from the joint meeting and all income from the summer Mathfest.

Where the money went

Expenses totaled $4,294,860 in 1998 compared to $4,708,501 in 1997.

	1997	1998
Journals	$ 1,473,845	$ 1,454,784
Publications/Electronic Services	$705,381	$ 845,042
Inventory Allowance	$ 80,200	$ 27,609
General Programs, Services and Projects	$ 615,847	$ 436,783
Executive, Finance and Human Resources Departments	$ 885,736	$ 850,212
Governance	$ 164,064	$ 151,750
Membership Processing	$ 547,848	$ 236,479
Development	$ 149,503	$ 163,810
Miscellaneous	$ 86,077	$ 128,391
TOTAL	**$4,708,501**	**$ 4,294,860**

Journals/Electronic Services include the cost of publishing and distributing the *Monthly, Mathematics Magazine,* the *CMJ,* FOCUS, *Math Horizons,* and our electronic newsletter, MAA Online.

Publications is the cost of our book and video publication program including shipping and handling costs.

General Programs and Services includes the cost of awards, minicourses, MAA portions of the joint meeting, the summer Mathfest, section support, SUMMA, student chapters, project support, our participation in joint projects and activities such as JPBM and the associated staff support.

Executive, Finance and Human Resources Departments is the cost of operating these three departments. These costs are not allocated to other activities.

Governance includes the costs related to the Board of Governors, section officers, executive and finance committees, and the officers.

Membership Processing is the cost of membership recruitment and fulfillment.

Development includes the cost of the Development Department as well as costs related to the Greater MAA Fund. This is an investment in future gifts as well as present contributions.

Contributors to MAA Programs and Services: January–June 1999

Annually hundreds of members give donations to the Greater MAA Fund to support MAA programs and services. These special programs support new mathematicians and help to develop the skills and opportunities for those working in mathematics education. The Board of Governors, officers, and staff thank each of you for your generosity.

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Assistant Professor of Mathematics

Harvey Mudd College invites applications for a tenure-track assistant professor in applied mathematics or discrete mathematics. Preference will be given to candidates whose research is in applied mathematics (application of mathematics to scientific or industrial problems, numerical methods, asymptotics, applied dynamics) or in discrete mathematics (broadly interpreted to include algebra, algebraic geometry, and combinatorics). Excellence in teaching is absolutely essential, as is evidence of a strong and ongoing research program. Candidates must be willing to supervise undergraduate research, and work with others in the development of departmental programs.

Harvey Mudd College is a highly selective undergraduate institution of science, engineering and mathematics; the average SAT score of entering students is over 1480. More than one-third of the student body are National Merit Finalists, and one year of high school calculus is a requirement for admission. Each year there are over 20 graduates in mathematics, with approximately half going to graduate school. Over 40% of mathematics alumni from HMC have obtained a PhD degree. The college enrolls about 650 students and is a member of the Claremont College consortium, which consists of four other undergraduate colleges and two graduate institutions, forming an academic community of about 5000 students. There is an active and vital research community of over 40 mathematicians in Claremont.

Claremont is situated approximately 35 miles east of downtown Los Angeles, in the foothills of the San Gabriel mountains. The community is known for its tree-lined streets and village charm. It is an easy drive from Claremont to the cultural attractions of the greater Los Angeles area, as well as the ocean, mountains and deserts of southern California.

Applicants should send a curriculum vitae, a description of their teaching philosophy and experience, a description of their current research program, and arrange to have three letters of recommendation sent to the address that appears below. Further information about the college and department may be found at http://www.hmc.edu. Preference will be given to applications completed by January 10, 2000.

Harvey Mudd College is an equal opportunity employer and is committed to the recruitment of applicants historically underrepresented on college faculties.

Address for applications:

Professor Andrew Bernoff
Chairman, Search Committee
Department of Mathematics
Harvey Mudd College
Claremont, CA 91711-5990

CALIFORNIA STATE UNIVERSITY NORTHRIDGE

The Department of Mathematics invites applications for two tenure-track appointments in pure and applied mathematics at the assistant professor level effective Fall 2000. California State University Northridge, which is classified as a Hispanic Serving Institution, is a comprehensive university located in the greater Los Angeles area. It is in close proximity to major research universities. The Department of Mathematics has 34 full-time faculty members and offers BA, BS and MS degrees. Candidates should have a Ph.D. in the mathematical sciences, a strong commitment to excellence in teaching both at the undergraduate and graduate level, and potential for success in research. Please send a vita, the AMS standard cover sheet and three letters of recommendations, one of which addresses the candidate's teaching abilities, to the Hiring Committee, Department of Mathematics, CSUN, Northridge, CA 91330-8313 by January 14, 2000. Email (inquires only) math.hiring1@csun.edu. California State University is an Equal Opportunity, Title IX, section 503 and 504 employer.

CONNECTICUT

SACRED HEART UNIVERSITY
Mathematics

Sacred Heart University, the third-largest Catholic University in New England is a dynamic, independent, coeducational, Catholic institution that is committed to excellence in academics and to the Catholic intellectual and liberal arts traditions. The main campus is in suburban Fairfield, one hour north of NYC and three hours south of Boston. At this time we are anticipating three tenure-track Assistant Professor positions beginning in August 2000. Ph.D. in Mathematics or

Math Education required. Specialization in Analysis and/or Statistics preferred. Commitment to teaching and the use of technology in the classroom are essential. Faculty members expected to teach major and non-major mathematics courses. Candidates with post-doctoral publications and grant writing preferred. Applications must include a complete resume, transcripts and three letters of recommendation and a letter indicating relevant qualifications and how the candidate will contribute to the fulfillment of the University's mission.

Please direct applications to Rose Marie Kinik, Chair, Mathematics Department, Sacred Heart University, 5151 Park Avenue, Fairfield, CT 06432 EOE/AA employer. Women and minorities encouraged to apply.

FLORIDA

STETSON UNIVERSITY

Stetson University invites applications for a tenure-track position beginning August, 2000. A Ph.D. in mathematics is required. Rank and salary will be commensurate with experience. The duties include teaching a broad range of undergraduate courses to both majors and non-majors, maintaining a program of scholarly activity, and undertaking university service. The teaching load is three courses per semester. Salary is competitive.

The successful candidate will exhibit an enthusiasm and talent for teaching, support department standards for student performance, and contribute to the intellectual life of the department. Because all students in the College of Arts and Sciences must undertake a senior project, candidates should be committed to fostering undergraduate research. An interest in interdisciplinary work or applied mathematics is a strong plus.

Stetson, Florida's first private university, is a small selective university of 2000 students. We are located in DeLand, Florida, 40 miles from Orlando and 20 miles from Daytona Beach. The department consists of seven mathematicians and four computer scientists, and has a variety of computing resources available, including computer-equipped teaching laboratories. Further information about our department is on our web page: http://www.stetson.edu/departments/mathcs/.

Please send the following to the address below: letter of application, curriculum vitae, AMS cover sheet, a statement of mathematical interests, and a statement of teaching philosophy as it pertains to a liberal arts curriculum. Also arrange for three letters of reference, at least one of which addresses teaching.

Search Committee
Department of Mathematics and
Computer Science
Stetson University
DeLand, Florida 32720

Stetson University, an equal opportunity employer, affirms the values and goals of diversity and strongly encourages applications from women and candidates from groups historically underrepresented in higher education.

INDIANA

HANOVER COLLEGE

MATHEMATICS. Tenure-track, rank open. Begins August 2000. Ph.D. preferred, ABD considered. Prefer specialties in probability/statistics. See http://www.hanover.edu/mathjob/ for full details. Send letter of application, vita, transcripts, and 3 letters of recommendation to Dr. Ralph Seifert, Chair, Math Search Committee, c/o Christine Wilcox, Hanover College, P. O. Box 108, Hanover, IN 47243-0108. Review of applications begins November 1, 1999, and continues until position is filled. EOE.

IOWA

UNIVERSITY OF NORTHERN IOWA
Assistant Professor of Mathematics

Seeking candidates for two tenure-track positions in mathematics. A Ph.D. in any field of pure mathematics, a superior teaching record, and an emerging record of research/ scholarship are required. The successful candidates will be expected to teach a broad spectrum of courses with a standard load of 9 hours per week. Applicants with recent collegiate teaching experience, interest in taking leadership in courses in history of mathematics, geometry, or general education, and an interest in innovative teaching methods are preferred.

Appointment begins August 2000. Salary is competitive with excellent fringe benefits. A current application file must be received by Jan 1, 2000 for full consideration. Please read the complete announcement at http://www.math.uni.edu. Address correspondence to Search Committee Co-Chairs, Department of Mathematics, University of Northern Iowa, Cedar Falls, IA 50614-0506, AA/EOE.

MARYLAND

SALISBURY STATE UNIVERSITY
Mathematical Sciences Position

Applications are invited for a tenure-track Assistant Professor position, beginning 15 August 2000, with a primary responsibility teaching mathematics to prospective elementary and secondary mathematics teachers. A Master's in mathematics and a doctorate in mathematics or mathematics education are required. Candidates should be committed to the NCTM Standards and should model excellence and innovation in teaching mathematics. Candidates must have a commitment to excellence in teaching, scholarly development, service, and departmental leadership in mathematics education. Candidates must communicate effectively in spoken and written English.

Salisbury State University is a selective undergraduate institution within the University System of Maryland. The University is close to ocean beaches and the Chesapeake Bay and 2-3 hours from the metropolitan areas of Washington, Baltimore, Philadelphia and Norfolk.

For additional information see **http://faculty.ssu.edu/~mathcosc/**.

Screening of applications will begin December 10, and will continue until the position is filled. Applicants should submit a cover letter including a statement of their teaching philosophy, a resume, and three letters of recommendation to:

Dr. Steven Hetzler
Search Committee Chairperson
Department of Mathematics and
Computer Science
Salisbury State University
Salisbury, MD 21801

Salisbury State University is an Affirmative Action/Equal Opportunity Employer. Women, minorities, and the disabled are encouraged to apply.

TOWSON UNIVERSITY
Mathematics Education Position

Associate/Full Professor, starting August 2000. The successful candidate is expected to provide leadership in designing and implementing new mathematics education programs, both at the undergraduate and graduate levels, including a potential doctoral program in mathematics education. Previous experiences in program development and graduate advising are essential. Salary, rank, and tenure will be commensurate with qualification and experience. Initial candidate screening will begin on January 3, 2000, but nominations, applications and inquiries will be received until the position is filled. The complete announcement can be found at http://www.towson.edu/math/Position2.html. Inquiries should be directed to Dr. Tad Watanabe via e-mail (tad@towson.edu), by phone (410-830-3585) or by fax (410-830-4149). Towson University is an equal opportunity/affirmative action employer and has a strong institutional commitment to diversity. Women, minorities, persons with disabilities, and veterans are encouraged to apply.

MASSACHUSETTS

BENTLEY COLLEGE
Department of Mathematical Sciences

At Bentley College, the focus is on business, people, and technology. With nearly 4,200 undergraduate, 1,600 graduate and 2,500 professional education students, Bentley is the largest business school in New England, and is fully

accredited by the AACSB. Bentley College is located on a fast growing campus in Waltham, Massachusetts, ten miles west of Boston.

Department of Mathematical Sciences

The Bentley College Mathematical Sciences Department anticipates a full-time tenure track position starting in fall, 2000. Candidates must, possess an earned doctorate. Those with backgrounds in Financial Mathematics, Quantitative Methods, Actuarial Science or other applied areas are especially encouraged to apply. Excellence in teaching, as well as strong research potential, is essential. Experience in integrating technology in a mathematical sciences curriculum is also highly desirable.

Additional responsibilities include service to the institution and the department.

Interested candidates should send a resume and arrange to have three letters of reference sent to: Dr. Marilyn B. Durkin, Chair, Department of Mathematical Sciences, Bentley College, 175 Forest Street, Morison Building, Room 361, Waltham, MA 02452-4705, (781) 891-2702; fax: (781) 891-2457; e-mail: mdurkin@bentley.edu.

Visit our website at: www.bnet.bentley.edu.

Interviews will be conducted at the DSI Annual Meeting in New Orleans in November and at the AMS/MAA Joint Meetings in Washington, D.C. in January 2000. Please inform us if you plan to attend either of these meetings.

Bentley College is an equal opportunity employer building strength through diversity.

For other employment opportunities, call our 24-hour Job Hotline at (781) 891-2889.

THE CENTER FOR MATHEMATICS EDUCATION (CME)

The Center for Mathematics Education (CME) at Education Development Center, Inc. (EDC) has positions open on several projects for candidates with a strong background in and love of mathematics; who enjoy writing and have the writing skills necessary to make mathematics clear and appealing to a broad audience; and who have experience in or at least knowledge of K-12 mathematics education and current issues. The CME offers an intellectually exciting work environment as well as opportunities to interact with groups outside of EDC such as teachers, students and professional organizations. Position and salary commensurate with experience. For more information about EDC or the CME go to http://www.edc.org or contact Helen Lebowitz at 617-618-2431 or hlebowitz@edc.org. AA/EOE.

MICHIGAN

CALVIN COLLEGE

Tenure-track and temporary openings beginning Fall 2000. Requires Ph.D in mathematics or statistics and excellence in teaching and scholarship. Statistician preferred for one position. Calvin College is a Christian liberal arts college, and faculty are expected to demonstrate a Reformed and Christian perspective in their professional work. Send CV, teaching statement, research program, statement of faith, and 3 letters of recommendation to Chair, Department of Mathematics and Statistics, Calvin College, Grand Rapids, MI 49546 by December 13, 1999. EOE. For more information about the position see http://www.calvin.edu/academic/math/.

GRAND VALLEY STATE UNIVERSITY

Grand Valley State University, in Allendale, Michigan, is accepting applications for the position of Assistant Professor of Mathematics, with employment to begin August 2000.

Qualifications are a Ph. D. in Mathematics; demonstrated excellence in teaching undergraduate mathematics; strong teaching recommendations; commitment to continued scholarly and professional growth; and commitment to engaging students in mathematics beyond the classroom. All candidates must be interested in teaching courses throughout the curriculum, including precalculus mathematics. We are especially interested in candidates with a preference for teaching service courses for our engineering and computer science programs.

For more information, including important details on how to apply, see our position description at www.gvsu.edu/mathstat/MATH99.html. For more information about our department, go to www.gvsu.edu/mathstat. Completed applications must be received by December 3, 1999.

MINNESOTA

MOORHEAD STATE UNIVERSITY

There are two positions open.

A candidate for each will be selected for the following position: Assistant Professor of Mathematics Tenure Track Appointment (Pending Funding) Rank and Salary: Salary is dependent on qualifications/experience. Qualifications and Experience: A Ph.D. or Ed.D. in Mathematics Education is strongly preferred. Substantial progress toward a terminal degree is required. Eligibility for licensure at some level K-12 and good communication skills is required. Preference will be given to candidates with evidence of successful teaching at the K-12 and college level.

Interest or experience in teaching a mathematics methods course and evidence of ability to work effectively as a member of a teaching team are desired.

Responsibilities: Teaching mathematics education methods and content courses and undergraduate mathematics courses. Other responsibilities include advising students, developing in-service workshops, service to the university, and maintaining an appropriate level of professional activity. The teaching load is twelve hours per semester, which may include supervising student teachers.

Application Information and Deadline: Screening of applications will begin January 17, 2000. Applications accepted until filled. Completed applications must include a resume, MSU Standard Application Form, graduate and undergraduate transcripts, and three current letters of reference. Successful candidate must be legally able to work in the U.S. on the day employment begins.

Apply to:

Don Mattson, Chair, Mathematics Department, Moorhead State University, Moorhead, MN 56563, (218) 236-2274; fax: (218) 236-2168; e-mail: mattson@mhd1.moorhead.msus.edu.

Moorhead State University is an EO/AA employer. Women, minorities, and persons with disabilities are encouraged to apply.

MOORHEAD STATE UNIVERSITY

Assistant Professor of Mathematics

Tenure Track Appointment (Pending Funding) Rank and Salary: Salary is dependent on qualifications/experience. Qualifications and Experience: A Ph.D. in mathematics or statistics is required. Preference will be given to candidates qualified to teach courses in upper division undergraduate statistics, numerical analysis or mathematical modeling. Preference will also be given to candidates with successful college teaching experience.

Responsibilities: Duties include teaching undergraduate mathematics courses, advising students, service to the university, and maintaining an appropriate level of professional activity. The teaching load is twelve hours per semester.

Application Information and Deadline: Screening of applications will begin January 17, 2000. Applications accepted until filled. Completed applications must include a resume, MSU Standard Application Form, graduate and undergraduate transcripts, and three current letters of reference. Successful candidate must be legally able to work in the U.S. on the day employment begins.

Apply to:

Don Mattson, Chair, Mathematics Department, Moorhead State University, Moorhead, MN 56563, (218) 236-2274; fax: (218)236-2168; email:mattson@mhd1.moorhead.msus.edu.

Moorhead State University is an EO/AA employer. Women, minorities, and persons with disabilities are encouraged to apply.

NEW HAMPSHIRE

RIVIER COLLEGE
Mathematics Faculty Position
The Department of Mathematics and Computer Science plans to hire one tenure-track position in mathematics at the assistant professor level for August 2000. Responsibilities include teaching a wide range of courses, participation in departmental and college service, ongoing scholarship and professional activity. A Ph.D. in mathematics or a related field is required. The candidate should also provide evidence of strong commitment to excellence in teaching, ability to work collaboratively within the department, willingness to integrate technology into mathematics courses, and familiarity with current trends in mathematics education.

The department offers bachelor degrees in mathematics, mathematics education and computer science, associate degrees in computer science, a Master of Science in Computer Science, and a Master of Arts in Teaching Mathematics. Teaching schedules include developmental, service, and liberal arts courses as well as courses for majors. Some classes are taught in the evenings and on Saturday.

Rivier College has the advantage of a central New England location in a thriving small city less than 50 miles from metropolitan Boston. With a student population of 2,800 undergraduate and graduate students, the College is recognized for academic excellence and a commitment to social justice coupled with professional career preparation in all its programs. The College welcomes women and men of all faiths to its faculty, staff, and student body. The candidate must demonstrate a personal and professional commitment to liberal arts education and to the promotion of the mission and traditions of a Catholic college.

Review of applications will begin December 15, 1999 and continue until the position is filled. Submit a curriculum vitae, a letter of application that describes ability to contribute to our programs, and the names and telephone numbers of three references to: Office of Human Resources, Rivier College, 420 Main Street, Nashua, NH 03060-5086. For more information about Rivier College visit our web site at www.rivier.edu.

Rivier College is an Equal Opportunity Employer.

NEW YORK

ALFRED UNIVERSITY
Mathematics
Applications are invited for two anticipated tenure-track positions at the assistant professor level in mathematics beginning August 2000. We seek Ph.D. mathematicians who are committed to excellent teaching of undergraduates, will maintain active scholarship and are willing to contribute to divisional and university activities. The area of expertise is open, but a willingness to teach a variety of undergraduate mathematics courses is essential.

Send letter of interest, curriculum vitae, graduate transcripts and three letters of recommendation (at least one of which directly addresses teaching) to:

Dr. Addison Frey
Division of Mathematics and Computer Science
Alfred University
Saxon Drive
Alfred University
Alfred, NY 14802
(E-mail: ffrey@king.alfred.edu)

We particularly encourage women and minority applicants. Alfred University is an Equal Opportunity employer.

Review of applications will begin January 24, 2000 and will continue until the position is filled.

NORTH CAROLINA

DAVIDSON COLLEGE
Applications are invited for a regular appointment in the Mathematics Department, with an initial two-year appointment at the Assistant Professor level to begin August 1, 2000. Consult the "Information for Applicants for Faculty link at http://www.davidson.edu/math/.

Davidson College is an Equal Opportunity Employer; women and minorities are encouraged to apply.

OKLAHOMA

OKLAHOMA CHRISTIAN UNIVERSITY
Oklahoma Christian University invites applications for a full-time position in mathematics beginning August, 2000. Pending funding approval, the position is a tenure-track position. The position requires a doctorate in mathematics or mathematics education. The applicant must have a strong commitment to teaching a broad range of courses at the undergraduate level. Experience in computer science or computer/calculator use in teaching mathematics is desirable. Other duties including developing curriculum, advising students, and participating in department and university activities. Oklahoma Christian is a private liberal arts university related to the Churches of Christ. Applicants must be active members of the Church of Christ. Applications should be sent to Dr. Ben Hutchinson, Dean of the College of Science and Engineering, Oklahoma Christian University, Box 11000, Oklahoma City, OK 73136-1100. Application deadline: February 1, 2000.

OREGON

PORTLAND STATE UNIVERSITY
Department of Mathematical Sciences
Assistant Professor Positions
Applications are invited for tenure-track assistant professor positions in applied mathematics, statistics, and a possible open position beginning September 16, 2000. Applicants are expected to have completed a doctoral degree in a mathematical science and show evidence of outstanding research potential and a strong commitment to excellence in teaching. Preference will be given to applicants with a commitment to interdisciplinary research and developing collaborations with industry. Further program information is available on our home page (http://www.mth.pdx.edu). Qualified applicant's applications materials should include (1) the AMS Cover Sheet for Academic Employment, (2) a curriculum vitae, and (3) three letters of recommendation. Send materials to:

Search Committee
Department of Mathematical Sciences
Portland State University
P.O. Box 751
Portland, OR 97207-0751
Email: search@mth.pdx.edu

All materials should be received by December 31, 1999. Portland State University is an Affirmative Action/Equal Opportunity Institution. Applications from women and minorities are especially welcome.

PENNSYLVANIA

ELIZABETHTOWN COLLEGE
Assistant Professor of
Mathematics Education
Elizabethtown College invites applications for a tenure-track position in Mathematics Education, appointment beginning August 2000. At the time of appointment, applicants should have a doctorate in mathematics education or a doctorate in mathematics with experience in mathematics education. In addition, applicants should provide evidence of excellence in teaching and be committed to the continuation of scholarly activity in mathematics education. Preference will be given to candidates who have secondary school teaching experience and teaching certification. Duties will include supervision of student teachers and teaching a methods course in addition to a variety of other mathematics courses in a liberal arts environment. Salary and benefits are highly competitive. Applications should be received by January 10, 2000.

Elizabethtown College, rated as one of the best northern liberal arts institutions by **U.S. News and World Report**, offers its 1,600 students 40 major programs in traditional liberal arts and professional fields. The Elizabethtown motto, "Edu-

cate for Service," expresses the College's mission of linking the world of work with the world of the spirit to advance the values of peace, justice and human dignity. Located in Pennsylvania's historic Lancaster County, Elizabethtown enjoys outstanding quality of life and easy access to the major metropolitan areas of Philadelphia, Washington, and Baltimore. For more information, visit our website at www.etown.edu.

Applicants should send letter of application, resume, transcripts, and three current letters of reference to Nancy E. Florey, Director of Human Resources, Elizabethtown College, One Alpha Drive, Elizabethtown, PA 17022, email-floreyne@acad.etown.edu.

Preliminary interviews will be available at the AMS/MAA Joint Meetings in Washington, D.C. in January 2000. Please inform us if you plan to attend these meetings. AA/EOE.

SHIPPENSBURG UNIVERSITY
Assistant Professor of Mathematics Education for August, 2000

QUALIFICATIONS: Doctorate in Mathematics Education with a masters degree (or equivalent) in mathematics, or Doctorate in Mathematics with a masters degree (or equivalent) in mathematics education. Candidates who will be completing their doctorate within one year will be considered on a contingent contract basis. The position requires excellence in teaching, as well as experience or potential in research and academic service. A demonstration of teaching effectiveness will be required as part of the interview. The candidate's experience teaching secondary-level mathematics and using technology in the classroom will be considered.

The primary responsibilities are to teach undergraduate mathematics and mathematics education courses, teach graduate mathematics education courses, supervise student teachers, advise students, conduct research and contribute to the academic climate of the department through writing grants, reviewing the curriculum, serving on committees, and interfacing with regional, secondary-level mathematics teachers.

THE DEPARTMENT: The Department of Mathematics and Computer Science includes 24 full-time faculty members. There are currently 170 computer science majors, 123 mathematics and mathematics education majors, and 66 graduate majors in the department. The department offers graduate programs in computer science, information systems, mathematics and mathematics education. The university computer equipment includes approximately 500 networked personal computers. Departmental facilities include a microcomputer lab, two computer classrooms, and a Mathematics Education Teaching Lab containing various laptop and desktop microcomputers, all of which are networked and have access to the Internet. The faculty works in a proactive environment, publishing student and faculty abstracts on various topics of interest, writing and successfully receiving competitive grants, writing and planning web-based courses through the "Virtual University" program, and planning and implementing a series of student seminars throughout the semester. In recent years, the department has been very successful in receiving both Whitaker and Eisenhower Professional Development grants for teachers in south central Pennsylvania in excess of $500,000. Other activities include a summer "math camp" for middle school through 12th grade students for the past two years, and faculty T3 professional development grants from Texas Instruments. A system-wide NSF Math/Science Professional Development grant has been submitted and approval is pending.

APPLICATION: Candidates must submit copies of graduate and undergraduate transcripts, publications (if any), a one-page statement of teaching philosophy, three letters of recommendation from persons familiar with candidate's professional competence, a current professional vitae and other appropriate information which demonstrate candidate's satisfactory qualifications. Incomplete applications and applications sent by e-mail will not be considered. Candidates will be judged on potential for teaching, research and university service. Review of applications will commence on January 1, 2000, and will continue until the position is filled.

APPLY TO: Mathematics Education Selection Committee, Department of Mathematics and Computer Science, Shippensburg University, Shippensburg, PA 17257. The telephone number is 717-477-1431.

Shippensburg University is committed to equal employment opportunity. Women, persons of color, veterans, and the disabled are encouraged to apply.

Check out our homepage at http://ark.ship.edu/~mathcs.

SHIPPENSBURG UNIVERSITY
Assistant Professor of Mathematics for August 2000

QUALIFICATIONS. A Ph.D. in mathematics or applied mathematics, effective communication skills, and a commitment to teaching excellence. Individuals who will be completing their Ph.D. within one calendar year of appointment will be considered on a contingent contract basis. Candidates must be able to teach all undergraduate mathematics courses offered by the department, and a demonstration of teaching effectiveness will be required as part of the final interview process. The ability to teach computer science, math education or applied math courses will be considered. Preference will be given to those candidates who can make direct contributions to existing activities within the department.

THE POSITION. The responsibilities of this tenure-track assistant professor position are to teach 24 credits per year of mathematics courses at the undergraduate and masters level, contribute to the academic and professional climate of the department, engage students in co-curricular activities, and serve on department and university committees.

THE DEPARTMENT. The Department of Mathematics and Computer Science includes 24 full-time faculty members. There are currently 123 mathematics majors (which includes those pursuing secondary teaching certification), 170 computer science majors, and 66 graduate students in the department. The department has two computer classrooms as well as an open computer lab for department majors, and has been a leader in the use of technology in mathematics instruction. Current faculty research interests lie in algebra, number theory, logic, combinatorics, graph theory and undergraduate mathematics education. Other activities in the department include undergraduate research, curriculum development and interdisciplinary research. Potential candidates are invited to visit the department's web site at www.ship.edu/~mathcs for more details about current projects and activities.

A COMPLETE APPLICATION will consist of (a) a cover letter which specifically addresses how the candidate will contribute to the S.U. Mathematics and Computer Science Department, (b) a one-page statement of teaching philosophy, (c) a photocopy of graduate transcripts, and (d) three letters of recommendation from persons familiar with the candidate's professional competence and qualifications. (At least one recommendation letter must specifically address the candidate's teaching effectiveness.) Preliminary screening will take place through phone interviews or the Employment Register at the Joint Mathematics Meetings in Washington, D.C., so applicants must provide valid e-mail addresses and phone numbers for contact and should indicate if they will be available during the Joint Meetings. Review of complete applications will begin on December 1, 1999. Incomplete applications and applications sent by fax or e-mail will not be considered.

APPLY TO Math Search Committee, Department of Mathematics and Computer Science, Shippensburg University, Shippensburg, PA, 17257.

Shippensburg University is committed to equal opportunity. Women, persons of color, veterans and the disabled are encouraged to apply.

UNIVERSITY OF PITTSBURGH BRADFORD

Mathematics. Anticipated full-time, tenure-track assistant professor position to begin Fall 2000. Must be able to teach developmental, precalc and applied calc level math courses. Ph.D. or Ed.D. required. Excellence in teaching and potential in scholarly work are essential. Applicants with computer or information science background will be given favorable consideration. Send application letter, vita, official transcripts, and three reference letters to: Dr. Yong-Zhuo Chen, Math Search Committee, Univ. of Pittsburgh at Bradford, 300 Campus Dr., Bradford, PA 16701-2898. Selection process will start on Jan. 1, 2000, and continue until the position is filled. Women and minorities are encouraged to apply. AA/EOE.

TENNESSEE

LAMBUTH UNIVERSITY
Tenure Track Position
Department of Mathematical Sciences

Mathematics: Lambuth University, a private liberal arts university affiliated with the United Methodist Church, seeks a Ph.D. in Applied Mathematics to begin August 1, 2000. Tenure track, Assistant Professor level, expertise in differential equations and numerical methods required. Send CV, transcripts and three letters of recommendations to Dr. Ronnie Barnes, Chair, Mathematical Sciences, Lambuth University. AA/EOE. www.lambuth.edu, 901-425-3283.

THE UNIVERSITY OF TENNESSEE, KNOXVILLE
Position Announcement

Subject to university approval, the Mathematics Department of the University of Tennessee seeks to fill a tenure-track assistant professorship in algebraic geometry or geometric group theory. A Ph.D. is required. Some postdoctoral experience is preferred but not required. Substantial research promise as well as dedication to teaching are paramount. Employment begins August 1, 2000.

Interested applicants should arrange to have a vita, three reference letters, a research statement (including abstracts), and evidence of quality teaching sent to Professor John B. Conway, Geometry Search, Mathematics Department, University of Tennessee, Knoxville, TN 37996-1300. Electronic applications are not acceptable. Use of the AMS application form is appreciated. Review of applications will begin December 1 and will continue until the position is filled. Information about the department can be found at http://www.math.utk.edu.

UTK Knoxville is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its eduction and employment programs and services.

THE UNIVERSITY OF TENNESSEE, KNOXVILLE
Position Announcement

Subject to university approval, the Mathematics Department of The University of Tennessee (http://www.math.utk.edu) seeks to fill a tenure-track position with an Outreach Mathematician (OM). The duties of the OM will be to foster close relations between the University and the community colleges and/or high schools across the state, collaborate with faculty in the College of Education, as well as teach in the department. The appointment will be at a rank that is commensurate with experience.

A Ph.D. in Mathematics or a doctoral degree in another discipline with a Masters of Science degree in Mathematics is required together with a clear commitment to outreach activities. Some postdoctoral experience is preferred, but not required. Dedication to teaching is paramount. Employment begins August 1, 2000.

We seek a person who will participate in the education program of the department, actively pursue grants to foster these aims, carry out systematic school visits, become involved in state-wide mathematics education reform, and work with the appropriate faculty in the College of Education.

Interested applicants should arrange to have a vita, three reference letters, a statement of accomplishments, qualifications, plans for outreach activities, and evidence of quality teaching sent to Professor John B. Conway, OM Search, Mathematics Department, University of Tennessee, Knoxville, TN 37996-1300. Electronic applications are not acceptable. Use of the recent AMS application form is encouraged. Review of applications will begin December 1 and will continue until the position is filled.

UTK Knoxville is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its eduction and employment programs and services.

THE UNIVERSITY OF TENNESSEE, KNOXVILLE
Position Announcement

Subject to university approval, the Mathematics Department of the University of Tennessee seeks to fill a tenure-track assistant professorship in probability and stochastic processes with emphasis on stochastic analysis, stochastic differential equations, or non-deterministic modeling. Preference will be shown to candidates working in applied aspects of these areas such as communication networks, mathematical biology and genetics, and mathematical finance. A Ph.D. is required. Some postdoctoral experience is preferred but not required. Substantial research promise as well as dedication to teaching are paramount. Employment begins August 1, 2000.

Interested applicants should arrange to have a vita, three reference letters, a research statement (including abstracts), and evidence of quality teaching sent to Professor John B. Conway, Probability Search, Mathematics Department, University of Tennessee, Knoxville, TN 37996-1300. Electronic applications are not acceptable. Use of the AMS application form is appreciated. Review of applications will begin December 1 and will continue until the position is filled. Information about the department can be found at http://www.math.utk.edu.

UTK Knoxville is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its eduction and employment programs and services.

TEXAS

SOUTHWESTERN UNIVERSITY
Department of Mathematics and Computer Science

The Department of Mathematics and Computer Science of Southwestern University invites applications for a tenure track position at the assistant professor level beginning August 2000. Candidates must possess a Ph.D. in Mathematics or Statistics, a commitment to excellence in undergraduate teaching, and an active interest in scholarly pursuits. The normal teaching load is three courses per semester. Southwestern University is a selective, undergraduate institution committed to a broad-based liberal arts and sciences education. Affiliated with the United Methodist Church, it has over 1,200 students and a history of stable enrollment. Southwestern's endowment of more than $340 million ranks among the highest per student of undergraduate institutions in the country. The University is located in Georgetown, Texas, 28 miles north of Austin. For more information, visit our web site at www.southwestern.edu. To apply, send letter of application, curriculum vitae, a statement of teaching philosophy, and three current letters of reference to: Southwestern University, Faculty Recruitment Office, Dept. of Mathematics and Computer Science, Job #9913, P.O. Box 770, Georgetown, Texas, 78627-0770. At least one of the letters of reference should address teaching. In order to receive full consideration, applications should be received by December 10, 1999. EOE/M/F.

TEXAS LUTHERAN UNIVERSITY

The Department of Mathematics invites applications for a tenure track position at the assistant pro-

fessor level starting in August 2000. Requirements for the position include a Ph.D. in mathematics by date of appointment, ability to teach effectively a wide range of introductory and advanced courses in the undergraduate curriculum, and a commitment to establish a research program suitable for undergraduate students. Send letter of application, curriculum vitae, statement of teaching philosophy, and five references (name, address, phone) to: John Masterson, Ph.D. Provost, Texas Lutheran University, 1000 W. Court St., Seguin, TX 78155; fax (830)372-8008, e-mail: jmasterson@txlutheran.edu. Review of applications will begin November 19, 1999, and will continue until the position is filled. We are dedicated to Equal Opportunity/ Affirmative Action in the work place. Web page: www.txlutheran.edu.

WASHINGTON

WESTERN WASHINGTON UNIVERSITY
Department of Mathematics

One or more tenure-track Assistant / Associate Professor positions; may be limited term if suitable alternatives not available. Begin Fall 2000. Expertise in statistics sought; other needs include algebra, combinatorics, topology and areas of applicable mathematics. Ph.D. required; postdoctoral experience preferred. Excellent teaching and research expected. WWU has 500 faculty and 11,500 students beside Bellingham Bay between Seattle and Vancouver, BC. Proximity to these cities, ocean and mountains gives access to superb recreational and metropolitan facilities. See /www.wwu.edu/~mathweb/ or write for details. Submit WWU summary (on website), vita, transcripts, description of teaching accomplishments and philosophy, and four references addressing teaching and research by December 3, 1999 to: Search Committee, Math, WWU, Bellingham, WA 98225-9063. AA/EOE.

WISCONSIN

UNIVERSITY OF WISCONSIN OSHKOSH

Two tenure track assistant professor positions to begin Sept. 2000. Ph.D. in mathematics or mathematics education required. Excellence in teaching essential; research, scholarship expected. For specific preference areas (and other information) see <www.uwosh.edu/mathematics>. Send letter of application describing specifically the contributions expected to be made to department, transcripts, statements of teaching philosophy and research interests to C. Patrick Collier; Mathematics Department; University of Wisconsin Oshkosh; Oshkosh WI 54901-8631. Have three letters (at least one addressing teaching) sent directly from references. Closing date December 31, 1999. AA/EOE. Strongly encourage applications from female and minority applicants.

PENNSTATE

ASSISTANT PROFESSORS OF MATHEMATICS
COMMONWEALTH COLLEGE

The Commonwealth College of Penn State University invites applications for tenure-track positions at the rank of assistant professor at its DuBois, Fayette, Hazleton, and Mont Alto campuses beginning August 2000. Tenure and promotion in the College is awarded on the basis of excellent performance in the following three areas: innovative teaching of courses ranging primarily over the first two years of college mathematics; recognized research and scholarly contributions to the faculty members field of interest; service to the Campus, College, University and the community at large. Applicants must complete the Ph.D. degree in a mathematical science by the time the appointment begins. Information about the Commonwealth College, the campuses, and the positions is available at **http://www.cwc.psu.edu**

All applications must be sent with cover letter, resume, the names, addresses, telephone numbers, and e-mail addresses (if available) of three references to:

Commonwealth College Faculty Searches
The Pennsylvania State University
111 Old Main, Box FOCUS
University Park, PA 16802

Applications will be accepted until the positions are filled.

Penn State is committed to affirmative action, equal opportunity and the diversity of its workforce.

Mathematical Olympiad Summer Program of The Mathematical Association of America

Applications are being solicited for the position of instructor at the Mathematical Olympiad Summer Program (MOSP), conducted annually by the Mathematical Association of America (MAA). This four-week program runs each summer at the University of Nebraska-Lincoln during the last weeks of June and early July.

Twenty-four to thirty exceptional high school mathematics students are chosen to participate in the MOSP on the basis of their performance on the American Mathematics Competitions and their capacity as potential members of the U.S. team to the International Mathematical Olympiad (IMO). All MOSP participants receive in-depth training in important undergraduate topics to stimulate their continuing interest in mathematics and help them prepare for future study.

Instructors in the program provide accelerated teaching and coaching in Advanced Geometry, Algebra, Number Theory, and Combinatorics. Extensive experience in working with outstanding mathematics students and familiarity with olympiad-type competitions is highly desired.

Applicants should send a copy of the Curriculum Vitae and a statement of related experience to Titu Andreescu, American Mathematics Competitions, 1740 Vine Street, Lincoln, NE 68588-0658 by February 1, 2000. It is expected that instructors will be selected by March 31, 2000.

The MAA is an equal opportunity/affirmative action employer.

The Mathematical Association of America

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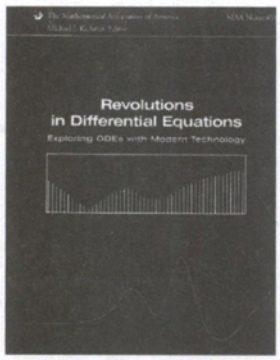

Revolutions in Differential Equations
Exploring ODEs with Modern Technology
Michael Kallaher, editor

The central theme of this book is to show how modern technology can be incorporated into differential equations courses. The book was written with the teacher in mind. The articles provide material for study and reflection that will help teachers pull out ideas relevant to their own classroom situations. Articles touch on a variety of topics: the use of laboratories in ODE courses, modeling using ODEs and computers, dynamical systems, computer exploration of concepts taught in ODE courses, ODE solvers and their use in the classroom, and Internet resources available for the ODE class. The authors of the articles represent a broad spectrum of workers in the field of differential equations.

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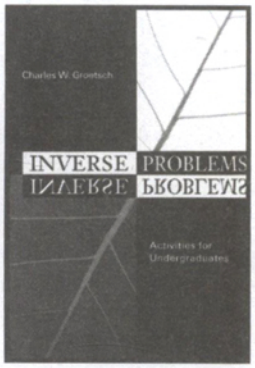
Inverse Problems
Activities for Undergraduates
Charles W. Groetsch

Inverse problems are hard to define, yet nearly all mathematicians recognize an inverse problem when they see one. As children we learn about the direct problem of multiplication: given two numbers we find their product. The corresponding inverse problem is to find a pair of factors of a given number. This book introduces mathematics instructors to inverse problems and provides them with resouces that are useful for teaching inverse problems to students in the first two undergraduate years. Scripts in MATLAB keyed to computations in the modules are provided in an appendix (the M-files may be downloaded from the author's web page).



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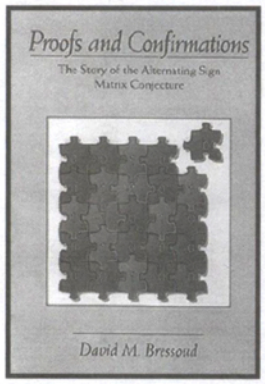

A joint publication of The Mathematical Association of America and Cambridge University Press

This is an introduction to recent developments in algebraic combinatorics and an illustration of how research in mathematics actually progresses. The author recounts the story of the search for and the discovery of a proof of a formula conjectured in the late 1970s for the number of $n \times n$ alternating sign matrices, objects that generalize permutation matrices. While it was soon apparent that the conjecture must be true, Zeilberger's eventual 1995 proof was elusive. The book is accessible to anyone with a knowledge of linear algebra. Students will learn what mathematicians actually do in an interesting and new area of mathematics, and even researchers in combinatorics will find something new here.

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